Society should take every opportunity of fostering. Hitherto we have looked only to the discovery of the surfaces of great lakes. I can quite well remember, when I first became officially connected with this Society, we were full of the discovery of Lake Nyasa, and now I hear, somewhat to my astonishment, that the Admiral at the Cape Station has actually proceeded to this lake, unknown 30 years ago, and hoisted his flag on one of Her Majesty's ships on that lake in order to inspect that portion of his squadron, and I venture to think when this has been done on the surface of the lake it will be considered within the duties of the hydrographer to explore its depths. But we all know that the hydrographer does all he can to further the interests of the department over which he presides, and will only be too glad to extend his usefulness. It now becomes our pleasant duty to return our thanks, not only to the deliverer of this interesting address, but also to others who have assisted him. I consider that the Society and this meeting owe their very grateful thanks to Mrs. Mill for the important part she has taken in this survey and also to Mr. Heawood, and including those two assistants in our vote, I request Dr. Mill to accept our cordial expression of thanks for his most interesting and valuable address.

DR. BAUMANN'S JOURNEY THROUGH EAST AFRICA.*

By E. HEAWOOD.

THE handsome volume which has appeared as the result of Dr. Baumann's journey in East Africa, 1891–1893, deserves a foremost place among recent African literature on many grounds. Although in no part passing beyond the limits of German East Africa, the route was so chosen as to traverse a surprising extent of new country in proportion to the total length, such as falls to the lot of few expeditions at the present day; and these unexplored tracts, for the very reasons which have caused them to remain so, are of special interest from various points of view. The scientific training, which Dr. Baumann had already put to good use both in East and West Africa, has enabled him to make the best use of his opportunities for observation, and the result is a work of solid value, not the least merit of which is the comparatively small space taken up with the incidents of the journey, and the amount of attention which can therefore be given to a general survey of the country passed through, in its geographical, ethnological, and economic aspects. The abundant illustrations are well chosen for the elucidation of the characteristic features of the country and its inhabitants, an unusually large number being devoted to the latter.

The general direction of Dr. Baumann's route is well known. Starting from Tanga, the rising port of entry into the northern part of the German Protectorate, and passing to the south of Kilimanjaro,

* 'Durch Massailand zur Nilquelle.' By Dr. Oscar Baumann. Berlin, Dietrich Reimer, 1894.

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he struck eastwards into the unvisited tract between that mountain and the Victoria Nyanza, discovering two new lakes, of one of which no report had previously reached Europe. After visiting the south-east shores of the Victoria Nyanza, where he traced the outlines of the gulf bearing his name, he made a tour through the Shashi countries lying east of the lake; and then, to add to his knowledge of the plateau region which he had left, returned by a more southerly route almost to Lake Eyassi. The last section of his outward journey led him to the hitherto untraversed country of Urundi, between the Victoria Nyanza and Tanganyika, containing the source of the Kagera, the principal feeder of the former lake. On the return journey, having reached Tabora by a new route through Uha, he still avoided the beaten track, striking northwards to complete the examination of the East African trough to the south of Lake Manyara. During this extensive journey he was several times compelled to fight to obtain a passage, the opposition of the exclusive Wambugwe near Lake Manyara having this beneficial result, that the cattle taken by way of reprisals afforded the much-needed food-supply for a great part of the journey.

Perhaps the most important section of the route was that through the area of island drainage lying between Kilimanjaro and the Victoria Nyanza. This is a region of elevated steppes and plateaux lying west of the East African schistose ranges, and traversed from north to south by the great East African trough, as well as by two side branches of it—that from which Kilimanjaro rises in the east, and that of the Wembere steppe and Lake Eyassi in the west, which forms a *cul-de-sac* in the plateau. The Masai steppe, almost uninhabited and waterless in the dry season, falls gradually to the central trough in which Lake Manyara is placed. This is a shallow salt lake, with thick deposits of salt on its shores, varying in size according to season, but never quite dry. South of the lake the depression continues more or less marked towards Ugogo. The western wall is by far the steeper, and forms the escarpment of the elevated Masai plateau. While the floor of the trough is of a steppe-like character, the greater precipitation on the plateau supports rich pastures and patches of forest. The air is always cool, and there is less variation between the seasons. The Wembere steppe resembles a salt desert, and the bounding heights are not as a rule inviting. Lake Eyassi shrinks even more than Manyara in the dry season, and its shores are more sandy and devoid of vegetation. The granite plateau of Unyamwesi to the west is marked by great uniformity of surface, mountains being replaced by piles of granite blocks, which are well shown in several of the illustrations. The streams are little more than rain-channels with broad sandy beds, and the dryness seems to be yearly increasing. Still there is water enough for cultivation, tracts of which alternate with uninhabited stretches of steppe-forest.

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With regard to the Victoria Nyanza, Baumann, like other travellers, noticed the apparent ebb and flow of the lake, without being able to decide whether it were due to winds alone. After falling for some years, the level is again rising. As regards the feeders of the lake, the author states fully his grounds for claiming to be the discoverer of the "Caput Nili," in the source of the Kagera. There can be no doubt—it was recognized both by Speke and Stanley—that this river is by far the most important feeder of the lake. Its volume is only a third less than that of the outlet, and the water of other streams, with that which falls as rain on the surface, is therefore not much more than enough to counterbalance the evaporation. The contention that the lake itself is the source of the Nile therefore loses its force. But, without wishing to detract from the honour due to the discoverer of the *most remote source* (*i.e.* measured along the stream), we cannot help thinking that the singling out of one among the countless rivulets which supply an equal amount of water, as *the* source of any river, meets the requirements rather of sentiment than science, and, in fact, it is chiefly in the case of rivers whose general origin has been involved in mystery that such an importance has been attached to the definition of the ultimate source. In connection with this subject, it is certainly remarkable that at the source of the Kagera Dr. Baumann should have come across the Missozi ya Mwezi, or "mountains of the moon," * and should have found the country of the Warundi, to be known to the neighbouring tribes as the "land of the moon," from a past ruling race, derived thence by tradition. While careful not to lay too much stress on this coincidence, Baumann thinks that an earlier greater extent of this kingdom may have led to the appellation being connected with the Nile sources. At all events, more is to be said for this theory than for that which connects them with Unyamwezi, which name was originated by the coast traders.

The country between the Victoria Nyanza and Tanganyika is traversed by the Central African schistose ranges which bound the Central African trough to the east. Characteristic of this region is the perennial nature of the streams, the amount of water derived from the hills being very great. The southern versant of the Nile-Congo watershed is, however, dryer than the northern. Lake Akanyaru, which had figured on our maps since Speke's time, has now to be dismissed, though the existence of a lake at the source of the Rusizi, also first mentioned by him, seems to have received confirmation.

The chapters dealing with the ethnology of the regions traversed are of special interest, the author not merely giving a full account of

* It is remarkable, also, that the locality should so closely agree with that in which Speke placed his "mountains of the moon," from which he derived the Kagera. It should be mentioned that the author fully appreciates Speke's merit, and dedicates his book to his memory.

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the customs, implements, etc., of each tribe, but dealing in a comprehensive way with their connection with one another, their origin, and so forth. The region is of particular interest as forming the borderland between the Bantu and Hamitic races, while the physical nature of much of the surface—the wide uninhabited stretches of steppe and plateau, roamed over by nomadic tribes—has kept many of the tribes untouched by contact with the outside world, many of their names being now heard of for the first time. In the area of inland drainage their variety is extraordinary. Hamitic in physical type, though of a "Nilotic" speech, are the Masai and their near allies, the Wataturu. The former seem destined to extinction from their want of intelligence, and of power to adapt themselves to life as agriculturalists. The tribe is already decimated by the effect of the cattle-plague. The Wataturu, formerly cattle-rearing nomads, have been compelled by the loss of their cattle to take to agriculture, though but a small number still survive. The Wafiomi, agriculturalists living south of Lake Manyara, speak a unique language, and seem to represent the oldest Hamitic immigration. They live in singular underground dwellings, apparently a modification of the flat-roofed "tembe," itself adopted as less exposed to fire during the attacks of the Masai than other forms. The Wambugwe and Wanyaturu are Bantu immigrants, the former from the south, the latter from the north; while the Wanege are of doubtful origin, but the richness of their language in "clicks" suggests a connection with the Bushmen, or Pygmies. They are a primitive, probably aboriginal, hunting tribe.

The tribes near the Nile sources do not show such a variety, being almost exclusively Bantu and agriculturalists, with the exception of the Watussi, a Hamitic race scattered through the countries west of the Victoria Nyanza. While forming the ruling class in Uganda and elsewhere, in other parts they form a caste of cattle-rearers. Their cattle, marked by the great development of horns, is allied, according to Dr. Adametz, to the "Sanga" of Abyssinia, which confirms the belief in the derivation of the tribe from those parts.* The Bantu tribes on the east and west of the Victoria Nyanza appear to have come from the north, while the Wanyamwesi advanced from the south and separated the two branches of northern immigrants. In speech the Wazinja, etc., west of the lake are related to the Wanyoro, but physically they have felt the influence of the Watussi, who have themselves, however, adopted the speech and mode of life of the peoples among whom they live. The Warundi have been little touched by northern influence. Among them dwell the Watwa, apparently allied to the dwarfs of the Congo forest.

* As the original home of the Hamites is believed to have been in Asia, so a resemblance has been traced between the skull of the Sanga and one of the varieties of the Indian Zebu.

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Dr. Baumann deals in a sensible way with the question of the economic prospects of the country. He insists especially on the necessity of looking forward to the future, as the present products of the country, ivory and slaves, will before long cease to be so, and the present trade route *viâ* Tabora already shows signs of decadence. Agriculture must, therefore, in the main, supply the commerce of the future. Vast expanses of fertile plateau-lands are eminently suited for this purpose, but they are at present unpeopled. The author builds great hopes on a systematic settlement of Wanyamwesi, the most enterprising and intelligent tribe of East Africa, in colonies in suitable localities. This must precede all thought of European settlement. The line which he favours for a railway is that passing south of Kilimanjaro, and *viâ* the Masai plateau to Speke Gulf, as opening the greatest extent of country likely to repay enterprise in the future. The physical difficulties would be less than in the case of the English scheme, while the presence of the suggested colonies would be an immense help towards the carrying out of the undertaking.

Cartographic Results of Dr. Baumann's Journey in East Africa.—The four-sheet map which Dr. Baumann has constructed, in conjunction with Dr. B. Hassenstein, from the results of his own surveys combined with previously existing material, has appeared as a supplementary number of *Petermanns Mitteilungen* (No. III.), accompanied by critical remarks on the methods employed in the surveys, and the amount of reliance to be placed on the newly-fixed positions in this part of Africa. Besides the route survey with watch and compass, supplemented by rounds of bearings of prominent objects, Dr. Baumann devoted much attention to astronomical observations, the results of which have been calculated by Dr. L. Ambronn. For a great part of the region traversed they supply for the first time a basis for the accurate construction of a map, and although the exclusive use of the sun for the determination of time and latitude has caused some of the work to be of less value than otherwise, it is pronounced to be, on the whole, an exceedingly valuable contribution to African cartography. The surveys of Captain Spring and Lieut. Werther have also been embodied, and Dr. Hassenstein gives a short *résumé* of the whole body of material available for the mapping of the region in question.

DR. G. M. DAWSON'S OBSERVATIONS ON THE BERING SEA.

In 1891 Dr. Dawson visited the Bering Sea as one of the British Commissioners in the fur-seal investigations, and on that occasion he made many geological notes, which he has published in the Bulletin of the Geological Society of America (v. 117–146). The Bering Sea, like the Seas of Okhotsk and Japan, is enclosed by an arc of islands, but communicates with the Arctic Sea on the north, as well as with the Pacific. Soundings show, however, that while the south-western part of the sea is very deep (1000 to 2000 fathoms), the north-eastern or Bering Strait region is never more than 100, and is commonly not over

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